

What is claimed is:

1. A backup power supply system for a restraint control module, comprising:

5 a main power source connected to a backup power source charging circuit and said restraint control module;

a backup power source connected to said backup power source charging circuit and said restraint control module;

10 a boost converter control and driver circuit connected to a boost converter switching device that is connected to said backup power source charging circuit, wherein said boost converter control and driver circuit drives said boost converter switching device to charge said backup power source with said backup power source charging circuit during normal power operation; and

15 a backup power supply control and driver circuit connected to a backup power supply switching device that is connected to said backup power source, wherein said backup power supply control and driver circuit uses said backup power supply switching device to switch the source of power to said restraint control module from said main power source to said backup power source during a loss of power from said main power source.

2. The backup power supply system of claim 1, further comprising a main power source monitoring circuit connected to said boost converter driver and control circuit and said backup power supply control and driver circuit for monitoring power on said main power source.

3. The backup power supply system of claim 1, wherein said backup power source charging circuit comprises an inductor connected to said main power source and said backup power source.

4. The backup power supply system of claim 1, wherein said backup power source comprises a capacitor.

5. The backup power supply system of claim 1, wherein said boost converter switching device comprises a first DMOS transistor.

5 6. The backup power supply system of claim 1, wherein said backup power supply switching device comprises a second DMOS transistor.

7. The backup power supply system of claim 1, further comprising a voltage regulator connected to said backup power source and said boost
10 converter control and driver circuit for regulating the output voltage generated by said backup power source.

8. The backup power supply system of claim 7, wherein said voltage regulator comprises an error amplifier connected to a pulse width
15 modulator comparator.

9. The backup power supply system of claim 1, further comprising a charge pump circuit connected to the output of said backup power source for powering at least one actual device.
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10. The backup power supply system of claim 1, further comprising an over-current protection circuit connected to said boost converter switching device and said boost converter control and driver circuit, wherein said over-current protection circuit causes said boost converter control and driver circuit
25 to stop switching said boost converter switching device to charge said backup power source if a predetermined current threshold is exceeded.

11. The backup power supply system of claim 1, further comprising an oscillator connected to said boost converter control and driver circuit and
30 said backup power supply control and driver circuit, wherein said oscillator is used to drive said boost converter control and driver circuit and said backup power supply control and driver circuit.

12. A backup power supply system for a restraint control module, comprising:

a main power source;

5 a backup power source charging circuit connected to said main power source;

a backup power source connected to said backup power supply charging circuit;

10 first means for switching said backup power supply charging circuit to charge said backup power source during normal power operation; and

15 second means for switching the power being supplied to said restraint control module from said main power source to said backup power source in the event said main power source experiences a loss of power.

13. The backup power supply system of claim 12, further comprising a power sensing circuit connected to said main power source, said boost converter control and driver circuit and said backup power supply control and driver circuit.

14. The backup power supply system of claim 12, wherein said first means comprises a boost converter control and driver circuit connected to a boost converter switching device, wherein said boost converter control and driver circuit switches said boost converter switching device to charge said backup power source with said backup charging circuit during normal power operation.

15. The backup power supply system of claim 14, wherein said boost converter switching device comprises a first DMOS transistor.

16. The backup power supply system of claim 12, wherein said second means comprises a backup power supply control and driver circuit connected to a backup power supply switching device, wherein said backup power supply control and driver circuit uses said backup power supply switching device to switch the source of power to said restraint control module from said main power source to said backup power source during a loss of power from the main power source.

17. The backup power supply of claim 16, wherein said backup power supply switching device comprises a second DMOS transistor.

18. The backup power supply system of claim 12, wherein said backup power supply charging circuit comprises an inductor electrically connected with said main power source and said backup power source.

19. The backup power supply system of claim 12, wherein said backup power source comprises a capacitor.

20. The backup power supply system of claim 12, further comprising a voltage regulator connected to the output of said backup power source for regulating the output voltage generated by said backup power source.

21. The backup power supply system of claim 20, wherein said voltage regulator comprises an error amplifier connected to a pulse width modulator comparator.

22. The backup power supply system of claim 12, further comprising a charge pump circuit connected to the output of said backup power source.

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23. The backup power supply system of claim 12, further comprising an over-current protection circuit connected to said boost converter switching device and said boost converter control and driver circuit, wherein said over-current protection circuit causes said boost converter control and driver circuit to stop switching said boost converter switching device to charge said backup power source if a predetermined current threshold is exceeded.

24. A method of providing backup power for a restraint control module, comprising the steps of:

- powering said restraint control module with a main power source during normal operation;
- sensing power on said main power source with a main power monitoring circuit;
- providing a boost converter control and driver circuit connected to a boost converter switching device;
- charging a backup power source with a backup power source charging circuit connected to said main power source and said boost converter switching device, wherein said boost converter control and driver circuit energizes said boost converter switching device to thereby transfer energy to said backup power source when said main power source is operating within a predetermined nominal voltage range; and
- switching power to said restraint control module from said main power source to said backup power source with a backup power supply control and driver circuit that is connected to a backup power source switching device, wherein said backup power source switching device is used to transfer power from said main power source to said backup power source.

25. The method of claim 24, further comprising the step of regulating the output voltage generated by said backup power source with a voltage regulator.

26. The method of claim 24, wherein said voltage regulator is connected to said backup power source and said boost converter control and driver circuit.

5 27. The method of claim 24, wherein said backup power source comprises a capacitor.

28. The method of claim 24, wherein said backup power source charging circuit comprises an inductor.
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29. The method of claim 24, wherein said boost converter switching device comprises a first DMOS transistor.

30. The method of claim 24, wherein said backup power supply switching device comprises a second DMOS transistor.
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31. The method of claim 24, further comprising the step of providing over-current protection to said boost converter switching device with an over-current protection circuit connected to said boost converter switching device and said boost converter control and driver circuit.
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